Accommodations Toolkit

Tactile Graphics: States' Accessibility Policies, 2023

This summary of states' accessibility policies for **tactile graphics** is part of the *Accommodations Toolkit* published by the National Center on Educational Outcomes (NCEO).[1] The toolkit also contains a summary of the research literature on tactile graphics.

Accessibility policies often have several tiers of accessibility features: universal features, designated features, and accommodations.[2] Figure 1 summarizes how states included tactile graphics in their accessibility policies for students with disabilities in 2020. Table 1 shows how tactile graphics were included in the policies, while Table 2 contains additional details and specifications.

Accessibility policies often have several tiers of accessibility features: universal features, designated features, and accommodations.[2] Figure 1 summarizes how states included tactile graphics in their accessibility policies for students with disabilities in 2023. Figure 2 summarizes how states included tactile graphics in their accessibility policies for English learners in 2023. Table 1 shows how tactile graphics was included in the policies, while Table 2 contains additional details and specifications.

Figure 1: States' Accessibility Policies for Tactile Graphics, 2023

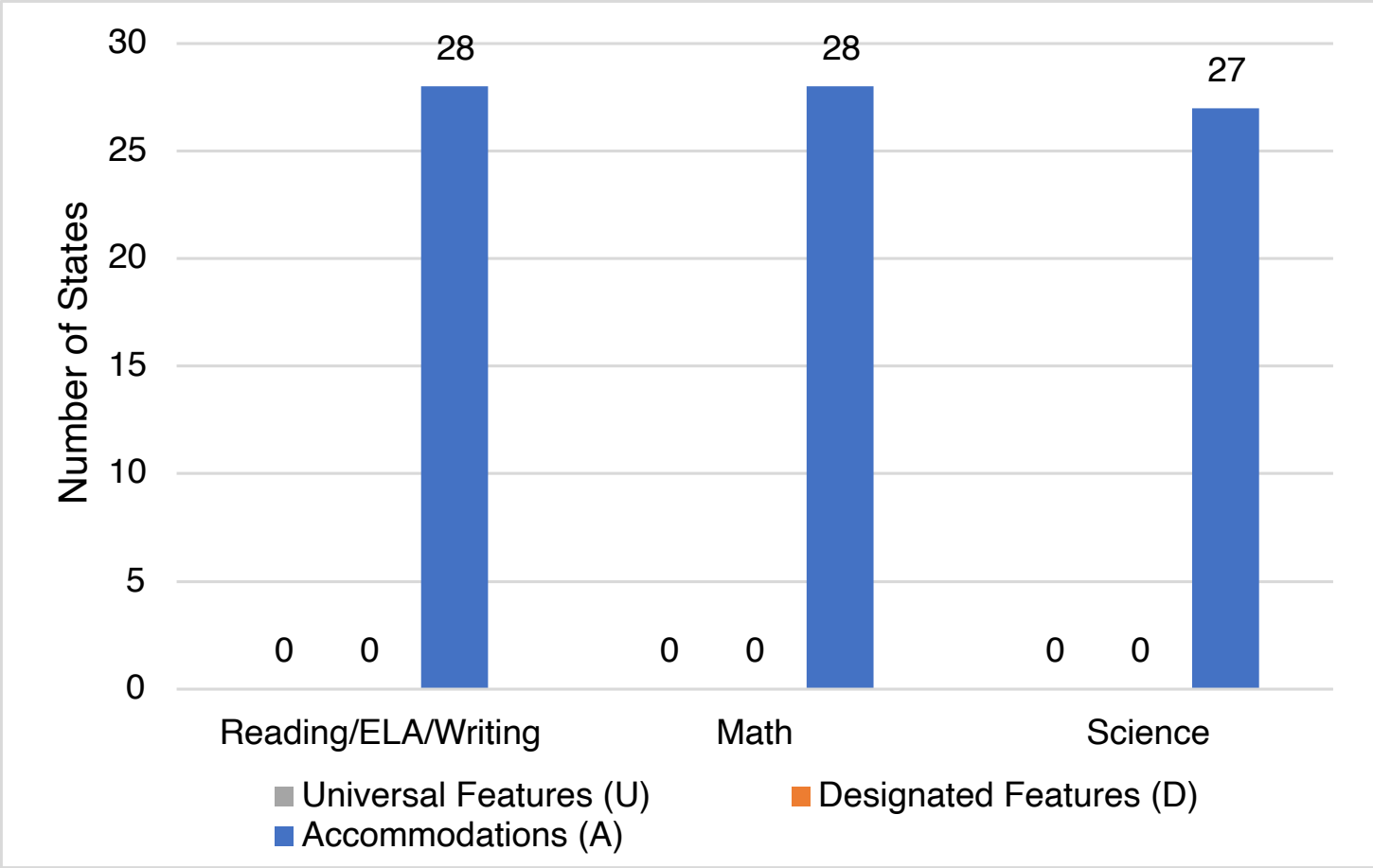

Figure 2. States' Accessibility Policies for English Learners for Tactile Graphics, 2023

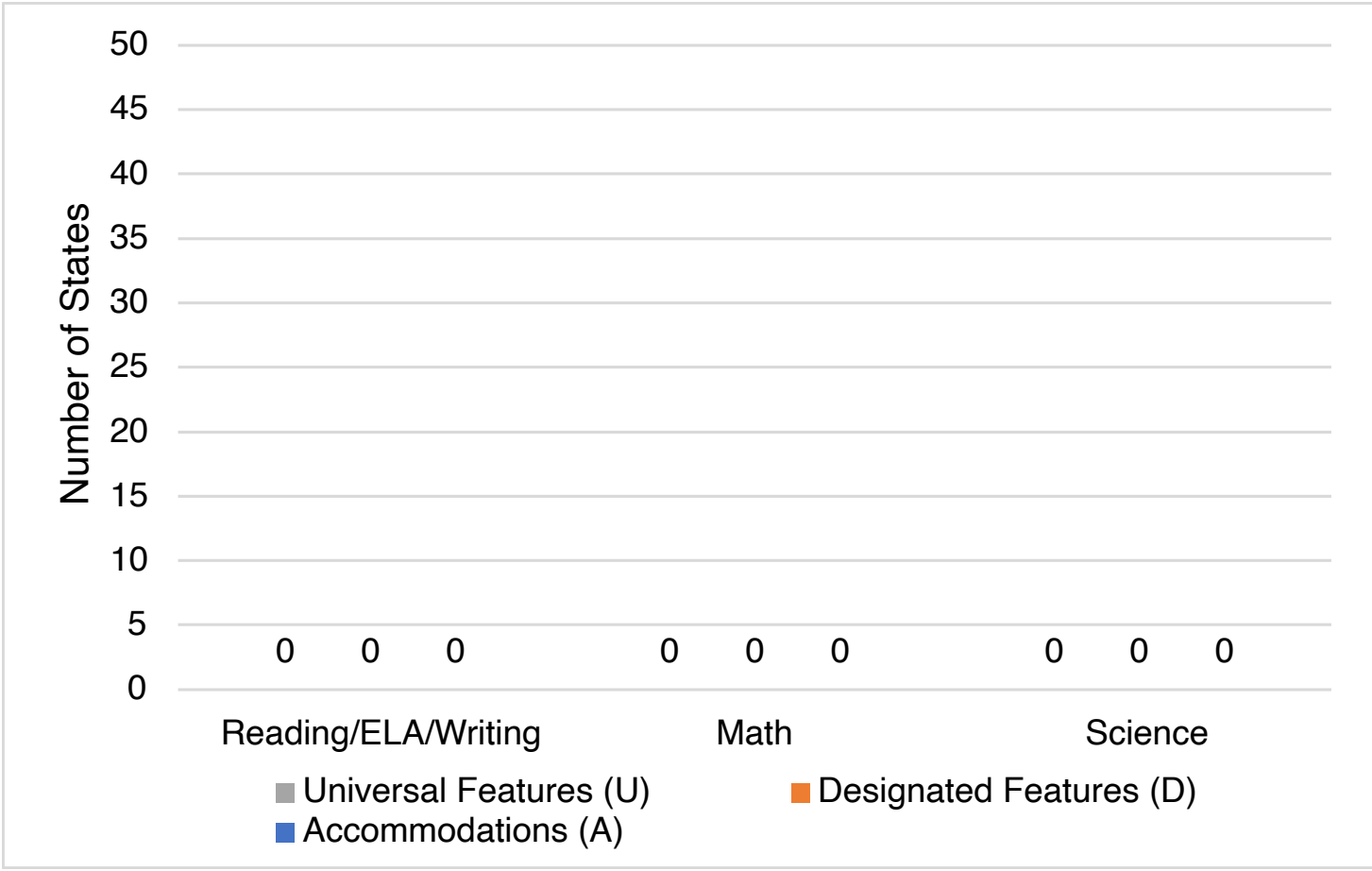

Table 1. Accessibility Policies for Tactile Graphics by State, 2023

U = Universal Feature, D = Designated Feature, A = Accommodation, ELA = English Language Arts, X = Allowed, SD =

State	Reading/ELA/Writing			Math	
	U	D	A	U	
Alabama			SD		
Alaska					
Arizona					
Arkansas			SD		
California			SD		
Colorado			SD		
Connecticut					
Delaware			SD		
District of Columbia			SD		

Florida					
Georgia					
Hawaii			SD		
Idaho			SD		
Illinois			SD		
Indiana					
Iowa					
Kansas					
Kentucky					
Louisiana					
Maine					
Maryland			SD		
Massachusetts					
Michigan					

Minnesota					
Mississippi					
Missouri			SD		
Montana			SD		
Nebraska			SD		
Nevada			SD		
New Hampshire			SD		
New Jersey			SD		
New Mexico			SD		
New York					
North Carolina					
North Dakota			SD		
Ohio					

Oklahoma					
Oregon			SD		
Pennsylvania			SD		
Rhode Island			SD		
South Carolina			SD		
South Dakota			SD		
Tennessee					
Texas					
Utah			SD		
Vermont			SD		
Virginia					
Washington			SD		
West Virginia			SD		

Wisconsin					
Wyoming			SD		
Total (Students with Disabilities)	0	0	28	0	
Total (English Learners)	0	0	0	0	

Table 2. Details and Specifications: States' Tactile Graphics Accessibility Policies

State	Details/Specifications
Arkansas	**Accommodation:** Braille, raised line drawings: Braille is a form of written language in which characters are represented by patterns of raised dots that are felt with the fingertips. English Braille American Edition (EBAE) was used as the braille code until Unified English Braille (UEB) was adopted. UEB is used internationally for English braille. Nemeth is a code developed in the United States for mathematics and science notation. EBAE is used in conjunction with Nemeth. UEB has its own mathematics and science notation. Graphics for braille are called raised line drawings. Charts, graphs, maps, diagrams, models, and symbols are translated into raised line drawings using multiple line heights, dashes, and textures to be felt by the fingertips. Raised line drawings often use labels to assist in understanding the tactile representation. Raised line drawings are used in conjunction with: • text-to-speech (+ orienting description) for online testing • a human reader for paper testing Recommended Usage: Examinees with visual impairments, including blindness, who are proficient in reading braille.
California	**Accommodation:** Braille: A student can use a resource that is a raised-dot code that an individual reads with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform), called tactile graphics. A student is provided with contracted or non-contracted braille; Nemeth and Unified English Braille (UEB) math code(s) are available for mathematics. The embedded resource is both embossed and refreshable. To request the CAST tactile package or the braille hybrid adaptive test for mathematics, contact the LEA Success Agent for the region at https://ca-toms-help.ets.org/contact/ (https://ca-toms-help.ets.org/contact/). Emergency PPT forms are available if a student cannot access the needed assistive technology for refreshable braille presentation and the embosser needed for administration of the computer-based CAASPP or ELPAC. Because the alternate assessments are administered in a one-on-one setting, this resource is not applicable to the CAAs or Alternate ELPAC.

Colorado	**Accommodation:** Tactile graphics: Tactile graphics are images that use raised surfaces so a student with a visual impairment can feel them. They convey non-textual information.
Delaware	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform). Students with visual impairments may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. The type of braille presented to the student (contracted or non-contracted) is set in ART, or member's comparable platform. The use of this accommodation may result in the student needing additional time. Refreshable braille is available only for ELA. For math, braille will be presented via embosser; embosser-created braille can be used for ELA also. Alternative text descriptions are embedded in the assessment for all graphics. The type of braille presented to the student (contracted or noncontracted) is set in TIDE. The use of this accommodation may result in the student needing additional overall time to complete the assessment.
District of Columbia	**Accommodation:** During Testing: A student who is blind or has a visual impairment who uses a screen reader or refreshable braille will also need a braille book, which includes visual descriptions of pictures and multimedia, where applicable. Tactile graphics will also be embedded in the hard copy braille edition assessments, when needed. For Mathematics assessments students will receive a full hard copy braille booklet rather than a tactile graphics supplement. After Testing: Braille test books contain secure item content and should be handled as secure test materials. Test Administrators should return tactile graphics to Test Coordinators. Test Coordinators must return braille books with the nonscorable materials.

Hawaii	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform). UEB Contracted and Uncontracted braille is available; Nemeth code is available for math. Students with visual impairments may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch (requires setting Emboss and Emboss Request Type accommodations in TIDE). Due to limitations with refreshable braille technology and math braille codes, refreshable braille is available only for ELA. For math, science, and EOCs, braille will be presented via embosser; embosser-created braille can be used for ELA also. Alternative text descriptions are embedded in the assessments for all graphics. The type of braille presented to the student (UEB Contracted or Uncontracted) is set in TIDE. The use of this accommodation may result in the student needing additional overall time to complete the assessment.
Idaho	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform). Contracted and noncontracted braille is available; Nemeth and UEB Math code(s) are available for math. Students with visual impairments may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. Due to limitations with refreshable braille technology and math braille codes, refreshable braille is available only for ELA. For math, braille will be presented via embosser; embosser-created braille can be used for ELA also. Alternative text descriptions are embedded in the assessment for all graphics. The type of braille presented to the student (contracted or non-contracted) is set in the test registration tool. The use of this accommodation may result in the student needing additional overall time to complete the assessment.
Illinois	**Accommodation:** Hard copy braille edition: A student who is blind or has a visual impairment and is unable to take the computer-based test with a refreshable braille display may take the ELA/literacy and mathematics assessments using the hard copy contracted braille edition. Tactile graphics are already embedded in the hard copy braille edition. For students using braille forms, the Test Administrator directions for filling in a circle, making marks, and erasing do not apply. Students should number their responses to be sure that their answers can be transcribed accurately into a scorable test booklet or answer document.

Maryland	**Accommodation:** Tactile graphics are raised images to convey non-textual information such as maps, graphs, and diagrams. Tactile graphics have labels in braille. Tactile graphics guidelines are followed to determine if an image should be created and if so, how. Some images are not necessary and can be omitted. Some images are substituted with letters, abbreviations, or words in braille. Before Testing: Students who require a tactile graphics booklet may either be registered for Screen Reader Version or Refreshable Braille display. Refer to those accommodations for before testing guidance. Tactile graphics will be embedded in the hard copy braille edition assessments, when needed. During Testing: Refer to Screen Reader Version and Refreshable Braille display for more information. After Testing: Tactile graphics booklets contain secure item content and should be handled as secure test materials. Test Administrators should return tactile graphics to School Test Coordinators.
Missouri	**Accommodation:** Braille: Students who are blind or have low vision and have this accommodation in their IEP/504 plan may access the assessment via a Braille version. Tactile overlays and graphics tools may be used to assist the student in accessing the content.
Montana	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform). Contracted and noncontracted braille is available; Nemeth and UEB Math code(s) are available for math. Students with visual impairments may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. Due to limitations with refreshable braille technology and math braille codes, refreshable braille is available only for ELA. For math, braille will be presented via embosser; embosser-created braille can be used for ELA also. Alternative text descriptions are embedded in the assessment for all graphics. The type of braille presented to the student (contracted or non-contracted) is set in TIDE. The use of this accommodation may result in the student needing additional overall time to complete the assessment.

Nebraska	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, illustrations) is presented in a raised format (paper or thermoform). Contracted braille (Unified English Braille - UEB) is available. Nemeth code is available for math. Students who are blind or have low vision may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. The use of this accommodation may result in the student needing additional overall time to complete the assessment. Specialized presentation of test: Examples of this accommodation are: (e.g., colored paper, tactile graphics, color overlay, magnification device, color of background, etc.) Students with visual impairments or other print disabilities may need assistance viewing content.
Nevada	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform). Contracted and non-contracted braille is available; Nemeth and UEB Math code(s) are available for math. Students with visual impairments may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. Due to limitations with refreshable braille technology and math braille codes, refreshable braille is available only for ELA. For math, braille will be presented via embosser; embosser-created braille can be used for ELA also. Alternative text descriptions are embedded in the assessment for all graphics. The type of braille presented to the student (contracted or non-contracted) is set in the test registration tool. The use of this accommodation may result in the student needing additional overall time to complete the assessment.
New Hampshire	**Accommodation:** Braille type: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (thermoform). Contracted and non-contracted braille is available; Nemeth code is available for math. Recommendations for Use: Students with visual impairments may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. Due to limitations with refreshable braille technology and math braille codes, refreshable braille is available only for ELA. For math, braille will be presented via embosser; embosser-created braille can be used for ELA also. Alternative text descriptions are embedded in the assessment for all graphics. The type of braille presented to the student (contracted or non-contracted) is set in TIDE. The use of this accommodation may result in the student needing additional overall time to complete the assessment.

New Jersey	**Accommodation:** Braille with Tactile Graphics: During Testing: A student who is blind or has a visual impairment and is unable to take the computer-based test with a refreshable braille display may take the ELA, mathematics, and science assessments using the hard-copy braille edition. Tactile graphics are already embedded in the hard copy braille edition. For students using braille forms, the directions for filling in a circle, making marks, and erasing do not apply. After Testing: Responses must be transcribed verbatim by a Test Administrator into the Transcription English test session. Important Note: Failure to transcribe student responses into the Transcription English test session will result in the student not receiving a valid scale score. At least two persons must be present during the transcription of student responses (one transcriber and one observer confirming accuracy). It is recommended that one of the individuals be a District Test Coordinator or School Test Coordinator (Refer to Appendix J: NJSLA and NJGPA for Students with Visual Impairments, Including Blindness.) Refer to Appendix C: Protocol for the Use of the Scribe Accommodation and for Transcribing Student Responses for protocol. Test Administrators are responsible for collecting all nonscorable student work created from assistive technology devices. Content must be deleted off all devices. Nonscorable student work must be securely shredded or destroyed. If the braille test booklet was disassembled, it must be reassembled for return. To reassemble test booklets, the Test Administrator may staple, or binder clip all pages for return. Failure to return all pages will be considered a breach of security. Tactile graphics: During Testing: A student who is blind or has a visual impairment who uses a screen reader or refreshable braille will also need a tactile graphics booklet, consisting only of the graphics portion of test questions, and visual descriptions of pictures and multimedia, where applicable. Tactile graphics will also be embedded in the hard copy braille edition assessments, when needed. After Testing: Tactile graphics booklets contain secure item content and should be handled as secure test materials. Test Administrators should return tactile graphics to Test Coordinators. Test Coordinators must include tactile graphics when returning secure test materials.

New Mexico	**Accommodation:** Before Testing: Assignment in iTester: must be assigned prior to testing. See Screen Reader for additional information. During Testing: A student who is blind or has a visual impairment and uses a screen reader or refreshable Braille will also need a Braille kit in order to access tactile graphics. After Testing: Student responses generated using the External Word Prediction Device software must be transcribed verbatim by a Test Administrator into iTester. Only transcribed responses submitted in iTester will be scored. Note: If the student is writing his/her responses directly into iTester through the external software for word prediction, then transcribing is not necessary. Refer to Appendix B: Protocol for the Use of the Scribe Accommodation and for Transcribing Student Responses. Test Administrators are responsible for collecting all non scorable student work created using external word prediction device software. Test-related content must be deleted from all devices. Non-scorable student work must be securely shredded. Important Guidelines for identifying students to receive this accommodation: IEP teams and 504 Plan Coordinators should carefully review the following guidelines before identifying a student to receive this accommodation. In making decisions about whether to provide the student with this accommodation, IEP teams, and 504 Plan Coordinators are instructed to consider whether the student has: A physical disability that severely limits or prevents the student from writing or keyboarding responses; or a disability that severely limits or prevents the student from recalling, processing, and expressing written language, even after varied and repeated attempts to teach the student to do so. Before listing the accommodation in the student's IEP/504 plan, teams/coordinators are instructed to consider whether: The student's inability to express in writing is documented in evaluation summaries from locally administered diagnostic assessments; the student routinely uses a word-prediction device or software during classroom writing assignments; and the student receives ongoing, intensive instruction, or intervention in language processing and writing, as deemed appropriate by the IEP team/504 Plan Coordinator.
North Dakota	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, illustrations) is presented in a raised format (paper, thermoform, or refreshable braille). Both contracted and uncontracted braille (English Braille, American Edition) are available; Unified English Braille will be adopted for future assessments. Both Nemeth code and UEB Math are available for math. Students who are blind or have low vision may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. The use of this accommodation may result in the student needing additional overall time to complete the assessment.

Oregon	**Accommodation:** Braille: A raised-dot code that individuals read with their fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform). Prior to administering the assessment through the braille interface, test administrator must receive both the general test administration and security training provided locally through the school district, as well as specific training on administering the assessments through the braille interface and its supporting braille technologies. In addition, districts must ensure that students using the braille interface receive training on all supporting braille equipment and receive an opportunity to access the sample test available on the OSAS portal prior to taking the test. Recommendations for use: Students with visual impairments may read text via braille. Tactile overlays, graphics, and braille print sticker labels may also be used to assist the student in accessing content through touch. All test content is available in braille via a refreshable braille display or embossed braille on paper. For mathematics and science assessments, standard braille math notation (Nemeth braille) is available only in the embossed braille materials. Math content will appear as plain text on a refreshable braille display but will not appear in Nemeth braille notation. Alternative text descriptions should be embedded in the assessment for all graphics. NOTE: All embossed braille materials must be collected and securely destroyed at the end of each assessment session to maintain test security.
Pennsylvania	**Accommodation:** Braille: Braille versions must be ordered in the DRC enrollment system. Paper Braille users may use the online audio version in addition to the paper braille version when determined appropriate by the IEP team. Responses must be transcribed verbatim into the student's regular answer booklet. The IEP team determines if the online audio version is appropriate for the student to use along with the braille version. Refreshable Braille: The online test engine is compatible with a refreshable Braille device that works with Job Access with Speech (JAWS). The JAWS website is Freedom Scientific JAWS website and is a valuable source to evaluate which refreshable Braille devices are compatible. Refreshable Braille users may also order the audio version when determined appropriate by the IEP team. Contact DRC to use refreshable Braille. (Note: Refreshable Braille is not available for the Classroom Diagnostic Tool [CDT] due to its adaptive functionality.) Tactile graphics: Students will be provided with the paper Braille booklet to access any graphics. Refreshable Braille enrollment will prompt the shipment of a matching paper Braille booklet. This booklet must be accounted for and returned to DRC. Select "Braille format" as a Presentation Accommodation and "Brailler/Note taker" as a Response Accommodation. Select "Refreshable Braille" in the online portal.
Rhode Island	**Accommodation:** Refreshable braille: Refreshable Braille in UEB with Nemeth is available. Tactile graphics for items can be printed using Print On Demand and an embosser or braille printer.

South Carolina	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, illustrations) is presented in a raised format (paper, thermoform). Contracted braille (Unified English Braille, Nemeth code) is available for math. Students who are blind or have low vision may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. The use of this accommodation may result in the student needing additional overall time to complete the assessment.
South Dakota	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform). Contracted and non-contracted braille is available; Nemeth and UEB Math code(s) are available for math. Students with visual impairments may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. Due to limitations with refreshable braille technology and math braille codes, refreshable braille is available only for ELA. For math, braille will be presented via embosser; embosser-created braille can be used for ELA also. Alternative text descriptions are embedded in the assessment for all graphics. The type of braille presented to the student (contracted or non-contracted) is set in TIDE. The use of this accommodation may result in the student needing additional overall time to complete the assessment.

Utah	**Accommodation:** Braille: Braille is a method of reading a raised dot code with the fingertips. Not all students who are blind or visually impaired read braille fluently or choose braille as their primary mode of reading. Even if they use braille as their primary mode of reading, students should also build skills in using electronic formats such as audio recordings and synthesized speech. Tactile graphic images provide graphic information through fingers instead of eyes. Graphic material (e.g., maps, charts, graphs, diagrams, illustrations) is presented in a raised format. Tactile sensitivity (recognizing graphic images through touch) is less discriminating than visual reading, making many diagrams too complicated to understand without significant additional information. Braille or tactile graphics may be used for instruction and assessment. Auditory descriptions of graphics may be available on assessments. Screen reading software, which includes both text and graphics description for students who are blind or visually impaired, can be used for instruction or assessment. Some screen readers, such as JAWS, are developed for computer users whose vision loss prevents them from seeing screen content. A refreshable braille display or braille terminal is an electro-mechanical device for displaying braille characters, usually by means of raising dots through holes in a flat surface. Computer users who are blind or visually impaired may use refreshable braille to read text output. Some students may need human assistance to enter responses, which is allowed for students using this accommodation.

Vermont	**Accommodation:**
	
	Braille and Braille plus Tactile Graphics: During testing: The following braille paper test book formats may be ordered and downloaded for local printing:
	
	• UEB
	  ◦ ELA and Science
	• Mathematics
	  ◦ UEB with Nemeth
	
	There are a variety of ways students can respond to the items on the braille assessment:
	
	• Students may record their responses using Braille on a separate Braille sheet of paper.
	• Students may record their responses directly in the Braille version of the test booklet.
	• Students may respond to the short-answer and open-ended questions using a word processor (without a spelling or grammar check) and respond to the multiple-choice questions directly in the Braille version of the test booklet.
	• Students may use a scribe to write oral responses or fill in bubbles for multiple-choice questions in the answer document.
	
	After testing: Student responses recorded in the Braille materials must be entered into the TestNav8 online testing platform as outlined in the "Paper-Based Testing Online Entry of Student Responses" section of the TAM.

Washington	**Accommodation (ELA, Math):** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform). Students with visual impairments may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. For additional information and settings for online braille, see Table 10: Embedded Braille Testing Supports.

West Virginia	**Accommodation:** Paper braille test booklet: This is a contracted braille paper form of the test. Uncontracted braille is not provided unless the WVDE Assessment Services receives a special accommodations request. Braille is a raised-dot code individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper, thermoform or refreshable braille display when available). The student uses contracted braille (a system that reduces the number of cells by abbreviating words or parts of words), and Nemeth code braille (a system used to convey technical expressions that occur in mathematics and science). Instructional practices: Instructional materials and assignments are completed in braille. When to select: For students who are blind or have low vision and read braille fluently or choose braille as their primary mode of reading. Students with visual impairments may read text via braille. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. The use of this accommodation may result in the student needing additional overall time to complete the assessment.
Wyoming	**Accommodation:** Braille: A raised-dot code that individuals read with the fingertips. Graphic material (e.g., maps, charts, graphs, diagrams, and illustrations) is presented in a raised format (paper or thermoform). Some students with visual impairments may use braille in order to access assessment materials. Tactile overlays and graphics also may be used to assist the student in accessing content through touch. Due to limitations with refreshable braille technology and math braille codes, refreshable braille is available only for ELA. For math, Braille will be presented via embosser; embosser-created braille can be used for ELA also. Alternative text descriptions are embedded in the assessment for all graphics. The type of braille presented to the student (contracted or uncontracted) is set in TIDE. The use of this accommodation may result in the student needing additional overall time to complete the assessment. Any portion of the test embossed during testing must be collected and securely destroyed in order to protect the security of the test content.

Footnotes

[1]

States' accessibility policies on tactile graphics were obtained through the examination and analysis of publicly available information, including accommodations manuals or other policy documents, on state department of education websites. The policies were gathered from states' websites between August and October 2023.The information in the tables from each state was coded based on information in the state policy.

[2]

Universal Features are available to all students as they access instructional or assessment content. *Designated Features* are available to any student as long as an educator (or team of educators, with student and parent input) indicates that they would be helpful given the student's characteristics and needs. *Accommodations* are changes in procedures or materials to ensure equitable access to instructional and assessment content and generate valid assessment results for students who need them. Accommodations are generally available to students for whom there is documentation on an individualized education program (IEP) or 504 accommodations plan; some states also have offered accommodations to English learners.

Attribution

All rights reserved. Any or all portions of this document may be reproduced and distributed without prior permission, provided the source is cited as:

Quanbeck, M., & Lazarus, S. S. (2024). *Tactile graphics: States' accessibility policies, 2023 (NCEO Accommodations Toolkit #1b.1)*. National Center on Educational Outcomes.

NCEO is supported through a Cooperative Agreement (#H326G210002) with the Research to Practice Division, Office of Special Education Programs, U.S. Department of Education. The Center is affiliated with the Institute on Community Integration at the College of Education and Human Development, University of Minnesota. Consistent with EDGAR §75.62, the contents of this report were developed under the Cooperative Agreement from the U.S. Department of Education, but do not necessarily represent the policy or opinions of the U.S. Department of Education or Offices within it. Readers should not assume endorsement by the federal government. Project Officer: David Egnor